

## New and little-known South African species of *Cydistomyia* and *Tabanus* (Diptera: Tabanidae)

by

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### SYNOPSIS

*Cydistomyia* (*Amanella*) *sulcipalpus* (Loew) is redescribed on fresh material from the Eastern Cape Province. *Tabanus nefas* n. sp. is described on a specimen from the Chipinda Pools district of Rhodesia, and is compared with other species of the *pullulus* group occurring in Southern Africa. *Tabanus vexans* Loew is redescribed on fresh material.

### INTRODUCTION

Both *Tabanus vexans* Loew and *Cydistomyia* (*Amanella*) *sulcipalpus* (Loew) are rare in collections. The recent acquisition of fresh material of both these species enables me to redescribe them and to note colour discrepancies between these specimens and the descriptions given by Oldroyd (1954). In most cases the discrepancies can be ascribed to fading, but there is also a certain amount of variation. As the colour pattern is all-important in this group I have kept notes on the colours of fresh specimens where there is any deviation from a description, and if confusion seems possible I have tried to publish further information.

The new species *Tabanus nefas*, described below, is a member of the *pullulus* group (Oldroyd, 1954: 203), and it seems opportune to compare it with the other two members of the group occurring in this subregion by means of a key and short character synopses.

This study was made during the tenure of a bursary from the Council for Scientific and Industrial Research, for which I make grateful acknowledgement.

Genus *Cydistomyia* Taylor

Subgenus *Amanella* Oldroyd

*Amanella* Oldroyd, 1954, *Horseflies Ethiop. Reg.* 2: 75.

*Cydistomyia* (*Amanella*) *sulcipalpus* (Loew)

*Tabanus sulcipalpus* Loew, 1858, *Öfvers. Kongl. Vet. Akad. Forhandl.* 14: 241.

*Amanella sulcipalpus* (Loew). Oldroyd, 1954, *Horseflies Ethiop. Reg.* 2: 83.

Five specimens in the Natal Museum from the Eastern Cape Province fit Loew's description well. The palpi are very narrow with a hairless groove. The third antennal

segment is fairly narrow (a relative term, as Oldroyd points out), but the width and extent of the dorsal angle vary, as does the colour (see fig. 3).

While walking beside a mountain stream running beneath *Podocarpus* trees in the Cambria District, and also beside a mountain stream below the Otterford Forestry Reserve, both localities in the Eastern Cape Province, my husband and I were bitten by this fairly small, yellowish tabanid. In both cases the streams were fast-flowing in a stony bed, with low banks, but the gradient was not very steep. Further upstream in the Otterford Reserve, where the stream descended steeply, we found none of the species. In the Cambria District they were biting in shade, but at Otterford were flying in the open at a place where the stream was bordered with grass and macchia. Usually we found the flies on bright, sunny days, but one was collected on a dull, overcast day. The flight is silent. The bright green eyes are a conspicuous feature of this species.

I have decided to redescribe *sulcipalpus* because the confusion which may arise due to variation in this species may make its identification uncertain.

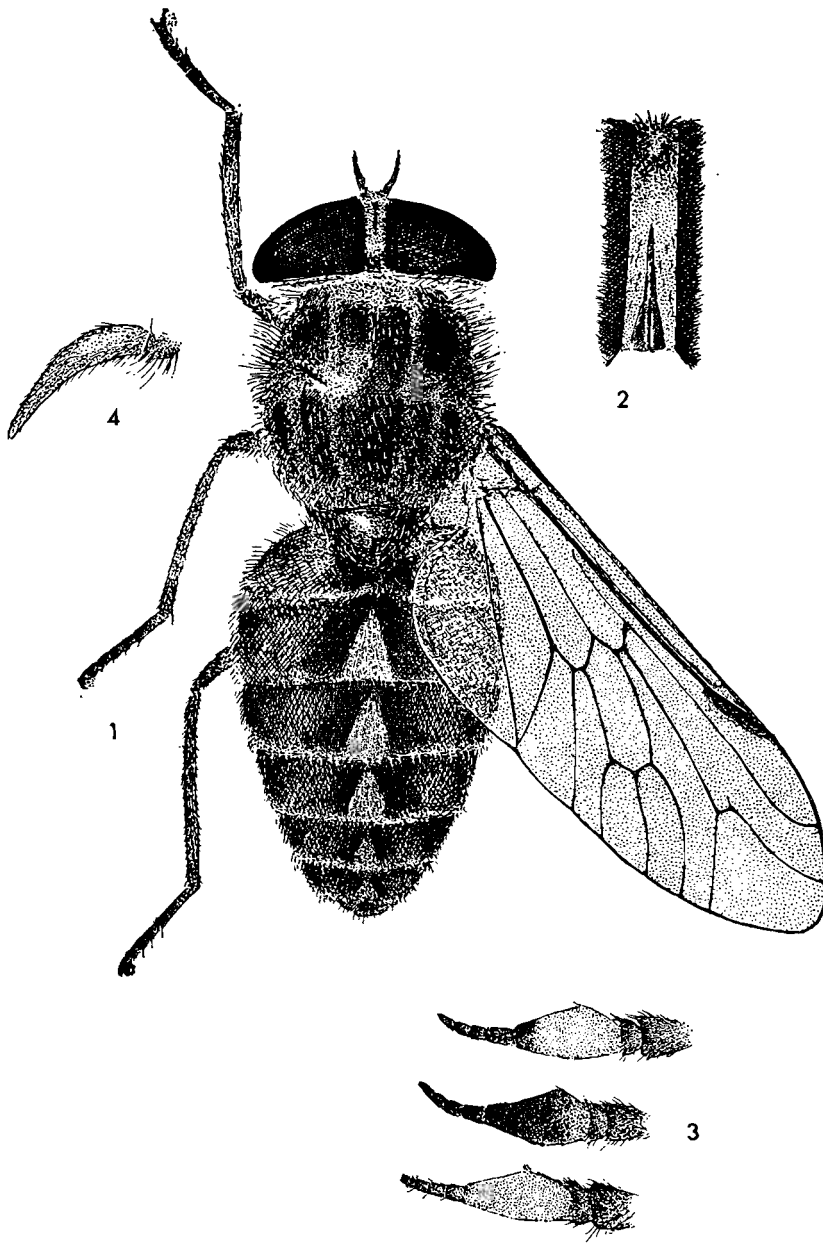
*Female* (fig. 1)

This is a fairly small dark yellow-brown fly with very narrow grooved palpi, rather narrow antennae, clear wings, and small pale median abdominal triangles.

The hairs on the dorsal surface are difficult to describe. There appear to be three main types of hairs, with the exception of a patch of curious white hairs on the first tergite on either side of the scutellum. There are black hairs, sparse, semi-erect and rather long, or short and recumbent; pale, yellow-white and golden hairs, usually almost recumbent, but long thick and erect laterally on first tergite; and short recumbent hairs which appear black in certain lights, but refract a shining pale golden colour. The latter are on the first tergite extensively sublaterally, where the hairs appear black but suddenly turn golden in oblique lighting, and on mesonotum and scutellum where they appear mostly golden until they are seen end on when they appear to be black.

*Head.* Eyes green in life, without bands, dark brown when dried; with rather sparse pale yellow hairs, not easily visible. Frons (fig. 2) virtually parallel sided, narrow, with light brown ('mouse-brown') tomentum, tinged yellow-grey at vertex around dark, shining black brown vertical patch which has three vestigial ocelli. At vertex is a patch of strong, bristly short black proclinate hairs, shorter black hairs less numerous over frons, mostly proclinate, but some, especially around tip of upper callus are reclinate.

Calli deep reddish-brown or blackish, lower callus not reaching eyes, subtriangular, broadly connected to narrow elongate upper callus which is only slightly expanded, and is sharply pointed (fig. 2). Subcallus slightly inflated, very thinly covered with light yellowish-brown tomentum, through which reddish-yellow or red-brown ground colour shows, this tomentum is very easily rubbed and five specimens have signs of rubbing. Face with whitish-grey tomentum tinged yellow laterally, dark red-brown ground colour shows through in places. Hairs mostly black, longest on sublateral longitudinal ridges; on medial surface hairs may be short, fine, black, longest dorsally, or fine, white and inconspicuous. I think that when Loew wrote 'white hairs ventrally, dorsally and at sides with short blackish hairs' the white hairs must be those on the median surface, and presumably the specimen he had, had those hairs dorsally, black. Four of the specimens I have seen have all the facial hairs



Figs. 1-4. *Cydistomyia* (*Amanella*) *sulcipalpus* (Loew). Female, frons, antennae and palp.

black, but one has all the median hairs white, so obviously variations occur. I have said the lateral hairs are longest, whereas he says they are short. This is a matter of opinion I think; the lateral hairs are fairly long by comparison with other hairs on the specimen, but short by comparison with hairs on other, hairier, species. It could be called a short-haired species.

Parafacials and buccae with ashy-grey tomentum, tinged yellow along eye margins, short black hairs numerous on parafacials becoming longer towards buccae, but long, white or slightly yellowish on lower buccae. Postoccipital fringe of short thick hairs, may be light red-gold, or darker, and may have some black hairs as well.

Palpi (fig. 4): First segment light yellow-brown with mostly long white or yellowish-white hairs; there may be a few shorter black ones apically. Second segment very narrow, light orange-yellow, darkest basally; a few short pale hairs below, but elsewhere there are numerous short stout black hairs except on long narrow, conspicuous groove on upper surface.

Antennae (fig. 3): First segment only slightly expanded apically, second small, with dorsal projection, both light brownish-yellow, with short stout black hairs. Third segment fairly narrow with dorsal angle of varying degrees of prominence; in one specimen there is only a very slight angle but in others it is quite conspicuous; there is also colour variation from altogether clear orange-brown to dusky-brown, except for orange base, but three specimens have only the tip dusky-brown and the rest clear orange-brown. Terminal segments dusky-brown or blackish.

*Thorax.* Mesonotum dark sepia-brown microscopically, although macroscopically it is blackish-brown. There is a very faint, indefinite pattern. Tomentum silvery-grey and very thin except behind the head, along lateral borders, and on sublateral strips which are very indefinite. Median stripe untomented, a fine, inconspicuous dark line. Prescutellar crescents present but not prominent. Both semi-erect and erect stiff black hairs, and nearly recumbent shining pale yellow and bronze hairs, are present. Lower part of notopleural callus with long black bristling hairs. Pleura: ground colour yellow-brown and dark brown or black, over which is whitish tomentum resulting in indefinite grey patches (mostly ventrally) on predominantly yellowish pleurites. The amounts of yellow and grey vary among the specimens. Hairs mostly long, pale, fine yellowish-white, but on mesopleuron are some black hairs. Pale hairs are longest on upper parts of pleurites, and are especially thick along hind margins of meso- and metapleura.

*Legs.* Coxae like pleura, tomentum whitish-grey over dark brown and yellowish-brown ground colour, giving diffusely yellowish and grey appearance. Hairs long, white, dull, both semi-erect and recumbent on first coxae, and shorter, very fine, rather sparse white ones on second and third. Femora more reddish, tomentum thin greyish-white, but inner surface of fore femora dark red-brown, bare and shining with short black hairs; outer surface has long semi-erect hairs, both pale and dark. Hairs on second femora short, black on inner surface, elsewhere long, yellowish-white, and hind femora with most hairs on inner surface broken off, and otherwise long, pale and very short black. Tibiae brownish-yellow, fore tibiae darkest and slightly reddish with short black hairs, mid and hind tibiae with mostly black hairs, but some pale ones on inner surface. Fore tarsi darkest, very dark

red-brown becoming sooty towards tip, mid and hind tarsi not so dark but also darkening towards tip, all with coppery hairs beneath. Claws black, pulvilli mustard yellow.

*Wings.* Membrane clear smoky-grey, veins dark yellow-brown basally becoming black-brown apically. Stigma deep red-brown or dark yellow-brown and conspicuous but not large.  $R_4$  with appendix usually well developed but in one case it is very small. Knob of haltere yellow apically, red-brown narrowly basally, stalk yellow-brown. Squamae smoky.

*Abdomen.* Yellow-brown with light yellowish median triangles and indefinite sublateral spots linked into inconspicuous stripes. First tergite grey around scutellum and with thin grey tomentum laterally, ground colour yellow-brown. Hairs laterally pale yellowish-white, thick and almost erect, shorter, recumbent black and bronze-yellow, the latter along hind margin and in median tuft; there is also small dense patch of up-swept, semi-erect white hairs on either side of scutellum. Tergites 2–6 with rather narrow pale triangles, not reaching anterior margins, the sixth rather faint; seventh tergite has dark median mark but no triangle. The ground colour is yellow-brown but darker brown surrounds median triangles; there are very indefinite sublateral spots, linked to form ill-defined almost evanescent stripes, also small pale lateral triangles which are little more than expansions of pale hind margin. Hairs pale laterally and on median triangles, bronze-yellow on hind margins, and recumbent; black elsewhere including on sublateral spots; numerous long black hairs on final two tergites.

Venter light orange-brown with pale hind margins, becoming progressively darker with diffuse darkening medially. Hairs, rather long, shining pale laterally, and shorter black medially; black hairs becoming more numerous towards apex, last three sternites with very few if any pale hairs.

*Measurements.* Length with antennae, 11,0–12,0 mm; wing 9,0–9,8 mm. Frons index: frons virtually parallel-sided but may be very slightly convergent or very slightly divergent, 2,0:1,8; 7,4, 1,6:1,7:66, 1,8:1,9:7,0.

*Localities.* At foot of that part of Elandsberg Range on which Otterford Forest Reserve is situated, Hankey Area, 1–10. 12.67. Witrivier Valley, Cambria, Patensie Area, 6.12.67. B. and P. Stuckenberg coll.

Genus *Tabanus* Linnaeus  
Subgenus *Hybomitra* Enderlein  
*Tabanus (Hybomitra) vexans* Loew

*Tabanus vexans* Loew, 1858, *Öfvers. Kongl. Vet. Akad. Forhandl.* 14: 336. Oldroyd, 1954, *Horseflies Ethiop. Reg.* 2: 141.

The following redescription is based on three medium-sized, dark tabanids found by my husband; these specimens were walking on rocks in the bed of a mountain stream on a clear, sunny day. In their saxicolous habit and bright green eye colour, as well as general appearance, they are similar to *T. saxicolus* Usher (1965) of the Natal Drakensberg Mountains, which is a member of the *chevalieri* group. The discrepancy which Oldroyd found between his material and Loew's description may well be due to fading, especially the colour of the stigma.

*Female* (fig. 5)

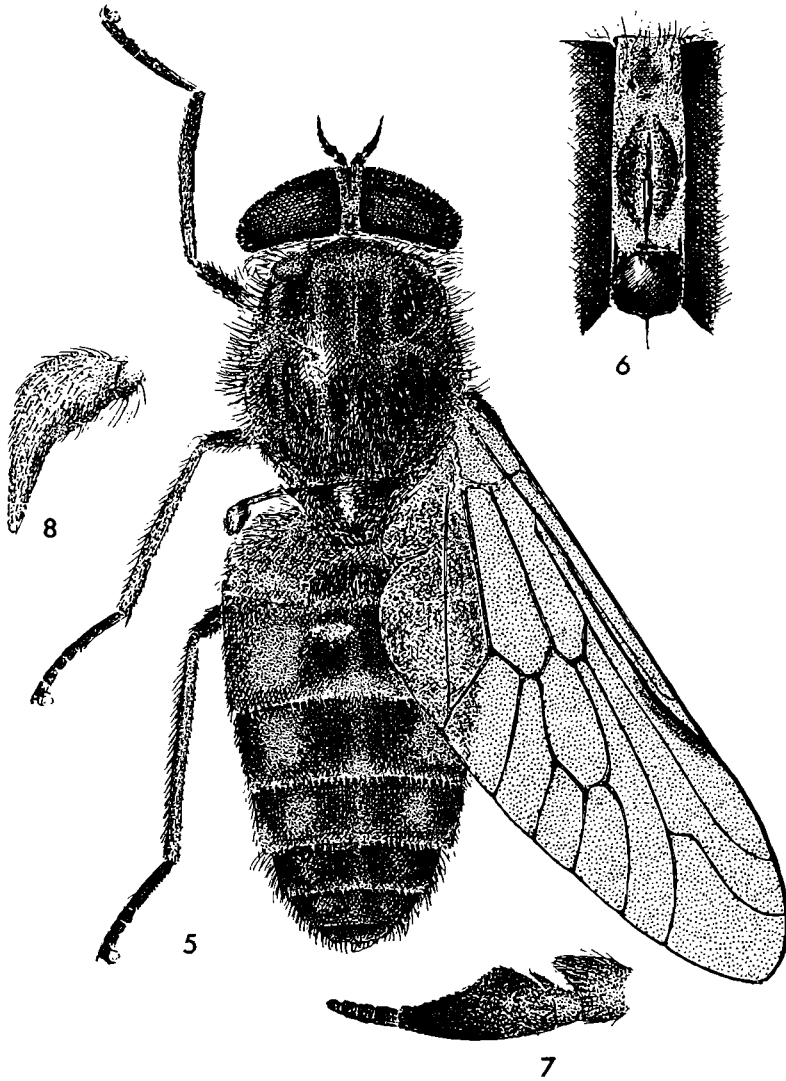
*Head.* Eyes in life deep green, unbanded, with short white hairs easily visible but not long or dense. Oldroyd gives the frons proportions as 5,5:4,5:19, index 4, convergent. The specimen in the Natal Museum has proportions 5:17,4, index 3,5, parallel sided. The frons (fig. 6) appears convergent, but is actually biconvex, very slightly (5,05) wider medially. Lower callus rectangular, almost square, deep red-brown with black on upper edge. Upper callus elongate, narrow, almost linear, black, with lanceolate dark area surrounding upper part as in fig. 6 with sooty tomentum and black hairs, this gives the appearance of a broadly lanceolate upper callus. At eye margins, beside upper callus, there is no tomentum; ground colour here is red-brown. Another bare red-brown area occurs at vertex. Tomentum ashy grey, tinged with yellow, hairs short, black and strongly proclinate on area surrounding upper callus, longer and still proclinate below but longer and erect above. Around bare vertical patch hairs are especially numerous, curled at tips and inclined in all directions. Subcallus slightly inflated, with background colour showing through ashy, yellowed-tinged tomentum; the specimen appears to be slightly rubbed. Face, parafacials and buccae with creamy-white tomentum, hairs on face long, mostly white and a few black, but on parafacials they are shorter, mostly black and a few white; on buccae hairs are long and almost entirely white.

*Palpi* (fig. 8): First segment dark grey basally, light yellow apically, hairs mostly long and some shorter and black. Second segment pale yellow, swollen basally tapering to pointed tip, hairs mostly short, thick and black but basally there are a few long white hairs on dorsal and ventral surface. Proboscis black.

*Antennae:* First segment broad, overlapping second, which is small, narrow, with dorsal projection, both rather dark with grey tomentum and numerous short stiff black hairs. Third segment with distinct dorsal angle (see fig. 7) dark, sooty brown only narrowly diffusely orange basally. Terminal segment dark, virtually black.

*Thorax.* Mesonotum dark sepia-brown, with ashy-grey tomentum anteriorly behind the head, on sublateral stripes anterior to transverse sutures and on lateral borders. Median stripes very narrow, yellow-brown, sublateral stripes posterior to transverse sutures also yellow-brown, not conspicuous at all, lateral stripes across supra-alar lobes similarly coloured, broad and diffuse. Hairs mixed, some fairly long, erect and black, others short, bronze and recumbent, hairs on notopleural lobe black and especially long and dense. Pattern not clearcut, general appearance being sepia-brown with faint yellowish stripes and silvery tomentum anteriorly and laterally. Scutellum sepia coloured with bronze and black hairs, both especially long around lateral and posterior margins. Ground colour of mesonotum and scutellum is black, it can be seen shining through wherever the specimen is at all abraded. Pleura with ashy grey and white tomentum over black and red-yellow ground colour, hairs predominantly long and dull white, but some are dark brown especially medially on mesopleuron.

*Legs.* Coxae like pleura, ashy grey and white tomentum over black ground colour, hairs mostly long, yellowish-white, a few dark especially apically on fore coxae. Femora with whitish grey tomentum over black ground colour, consequently they appear grey, tinged with yellow, but the inside face of fore femora is bare, shining black, only slightly grey



Figs. 5-8. *Tabanus vexans* Loew. Female, frons, antenna and palp.

basally with short recumbent black hairs and long fine erect ones on lower margin. Hairs otherwise mostly long, pale, yellowish-white, but there is a patch of short black hairs on inner surface of mid femora and knees. Apical joints narrowly yellow. Fore tibiae yellowish-white with more than lower third black, hairs black, semi-erect and shining pale yellowish recumbent, almost entirely black on black areas. Mid and hind tibiae only narrowly darkened at apices, hairs as on fore tibiae, but hind tibiae have fringe of black hairs on outer hind edge. Tarsi black-brown, fore tarsi virtually black, all with black hairs. Claws black, pulvilli orange.

*Wings* clear, slightly smoky, stigma dark yellow-brown, but macroscopically it does appear black. I think the discrepancy of colour between Loew's and Oldroyd's descriptions may be partly due to fading in old specimens and partly due to better lighting and magnification. Haltere stalk light yellow-brown, darkened before knob; knob reddish-brown, and deep yellow at tip.

*Abdomen.* First tergite basically sepia-brown, dark gun-metal grey anteriorly beside scutellum, sublateral spots small, irregular, pale yellowish, with pale yellow hairs. Between spots tergite is very dark brown, with median tuft of pale yellow hairs; hairs black on brown areas. Second tergite narrowly grey on anterior border then dark brown with black hairs; sublateral spots pale, irregular, with pale hairs, also diffuse and ill-defined pale median triangle which has pale hairs. Subsequent tergites similarly coloured, dark sepia brown with black hairs, diffuse median triangles and irregular sublateral spots with pale hairs decreasing in size posteriorly, pale hairs also on hind margins. Seventh tergite medially pale but sublateral spots are not apparent, hairs long and dark.

Sternites grey with pale brown bands in front of very narrow pale yellow hind margins, hairs long, both dark and pale. Long, thick, black hairs conspicuous on ultimate and penultimate sternites.

*Male* (fig. 9)

*Head.* Eyes with a denser pile of slightly longer white hairs. Antennae similar to those of female, but third segment narrower. Hairs elsewhere on head generally darker and longer, colour pattern otherwise the same.

*Thorax.* Mesonotum as in female but more hairy, with black hairs notably very long and nearly erect, stripes therefore less obvious. Pleura and coxae darker grey with higher proportion of dark hairs, pale hairs yellower, hairs generally longer.

*Legs.* Altogether darker than in the female; in one specimen they appear blackish throughout, only mid and hind tibiae being slightly reddish. Fore femora almost completely black with black hairs, narrowly orange apically. Mid and hind femora with some grey tomentum but still appearing a deep grey; hairs long, mostly black and dark brown. Fore tibiae only slightly pale basally, predominantly blackish, mid tibiae mostly reddish, hind tibiae darker with mostly dark hairs, conspicuous fringe of black hairs on outer angle.

*Wings.* Clear, slightly smoky, veins yellowish basally, dark elsewhere. Stigma dark yellow-brown. Haltere knob brilliantly orange-yellow, brown basally, stalk yellow-brown.

*Abdomen.* Much darker and more hairy than that of female, dark sepia-brown with black hairs. First tergite very dark, with silvery pale sublateral spots and pale yellowish hairs close to scutellum but no pale hairs medially. Remaining tergites deep red-brown, blackish medially between sublateral small silvery-grey spots; hind margins very narrowly pale. Median triangles reduced to slight broadening of hind margins medially, with pale hairs. Sublateral spots diminish in size rapidly. Medially on second tergite is a patch of long, almost erect black hairs. Fifth tergite with only faint, small spots which on sixth tergite are evanescent. Sternites dark brown with grey tomentum mostly laterally, and narrow, pale yellow hind margins; hairs pale and also long and dark.



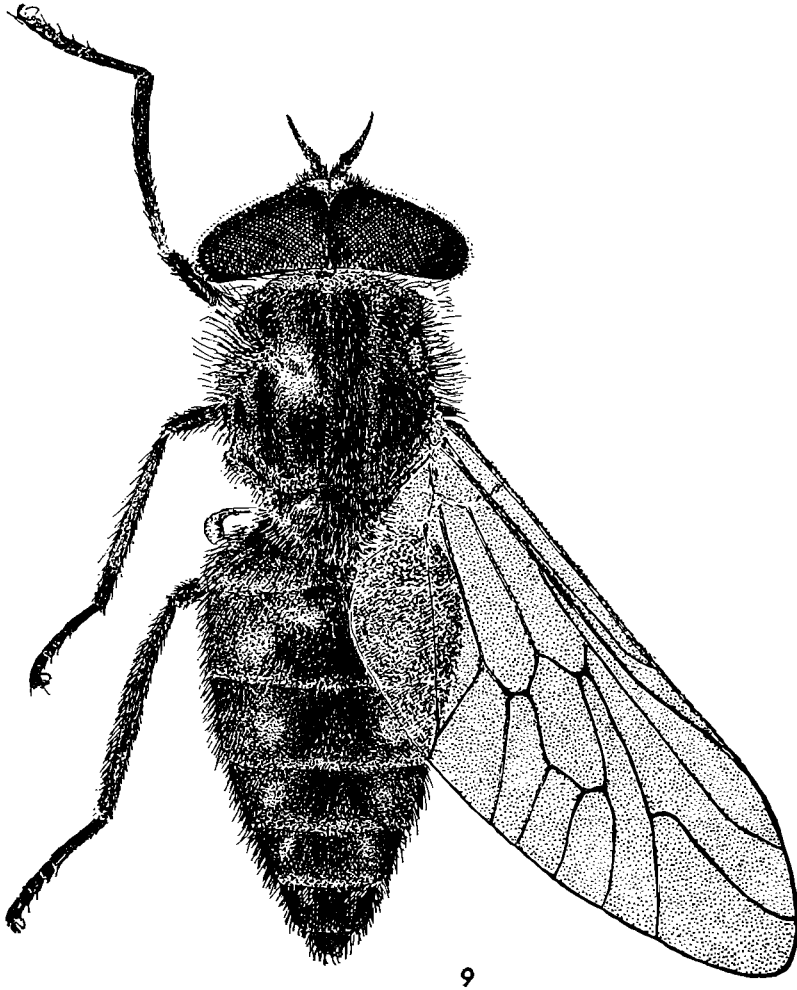


Fig. 9. *Tabanus vexans* Loew. Male.

*Measurements.* ♀ length with antennae 14,0 mm, wing 11,0 mm; ♂♂ length with antennae 11,8 and 14,0 mm, wing 9,4 and 10,5 mm.

*Material examined.* 2 ♂♂, 1 ♀. Otterford Forestry Reserve lower boundary, on stones in stream at road crossing, Hankey area, Eastern Cape Province, 1–10 December 1967.

*Tabanus pullulus*-group

Oldroyd, 1954, *Horseflies Ethiop. Reg.* 2: 203.

***Tabanus nefas* n. sp.**

This species is based on a unique not in the best condition: two legs are completely missing, as well as the hind tarsi; the thorax is distorted and the head appears to be rubbed.

I am describing the specimen only because I have had it for some time; its colours, which are of prime taxonomic importance, are beginning to fade and no further material has been forthcoming nor is there hope of any in the foreseeable future.

Because the frons appears to be rubbed I cannot be certain to which group the specimen belongs. By using comparative material from the Natal Museum I have decided that no connection can be established with the *sufis* group and therefore presumably a more or less well defined upper callus once existed. The subcallus is definitely though not greatly inflated and the shape of the frons has more in common with the *pullulus* than the plain group. The general appearance of the fly is very like *pullulus* Austen. However it will be the only member of this group with wholly dark tibiae and with smoky wings, whereas in the plain group both dark legs and wings occur in more than one species. This may prove to be an intermediate species, but in the absence of conclusive proof, and on account of the strong similarity to *pullulus*, I rather tentatively link this with the *pullulus* group.

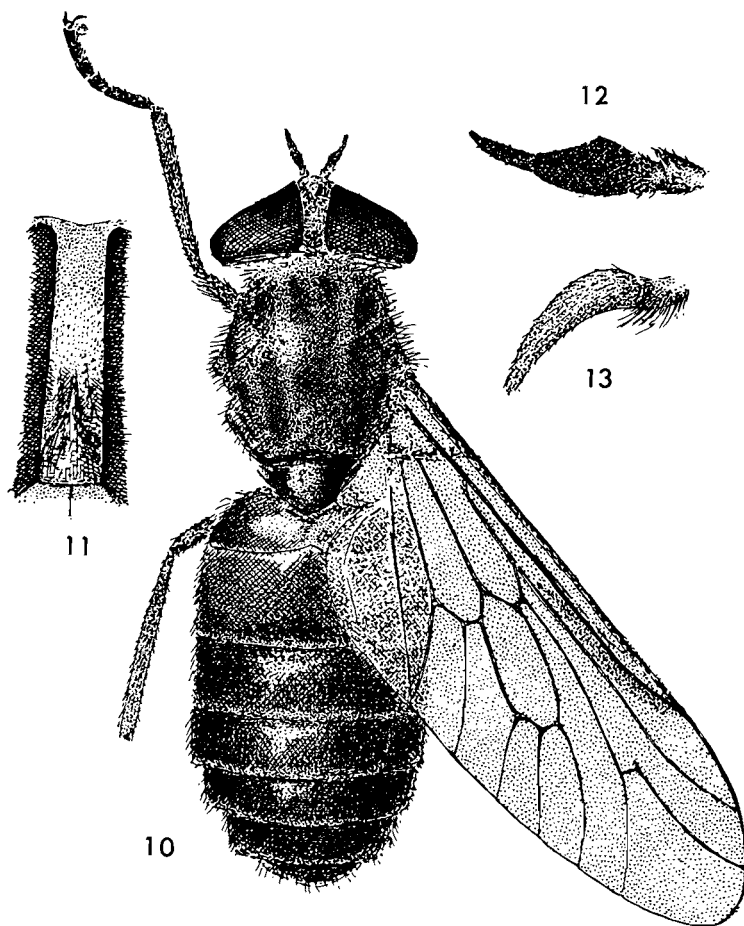
The general appearance is of a blackish, medium-sized fly which is peculiar for the total lack of pattern or obvious distinguishing features.

*Female* (fig. 10)

*Head.* Eyes bare, dull-brown in dried specimen. Frons (fig. 11) narrow, slightly divergent, index 4,1, yellow-brown, darkened at vertex and straw-yellow across area of upper callus; there is some tomentum at vertex and along eye margins, but the frons may be rubbed. Lower callus approximately onion-shaped as in fig. 11, light brownish-yellow, wrinkled and semi-shining. Upper callus appears to be short, raised, broadly joined with lower callus, and tapered sharply. As the frons on either side of the upper callus is shining, I cannot be certain that this is the full extent of the callus, although this would fit well with the conformation of the calli of other species of the *pullulus* group. Possibly the species simply has a very short upper callus without tomentum on either side; *obscuristriatus* Ricardo has 'a linear upper callus which is ridged but is irregularly extended in each side of the ridge'. However as the specimen is not in good condition, it is best not to place too much reliance on the description of the upper callus, only fresh material can prove whether it is damaged or not. Subcallus distinctly but not greatly protuberant, shining with thin tomentum mostly along edges, possibly due to rubbing. Parafacials with mostly lightish mustard-yellow tomentum and rather short sparse dark brown hair; there is a dark smudge in tomentum from beneath antennal collar down crest of bulge beside face but not continued to lower buccae; this may be due to darker ground colour showing through thin tomentum. Face yellow-brown in ground colour, with thin, light mustard-yellow tomentum. There is a bright shining, tomentum-less patch immediately beneath antennae but this appears to be unnatural. Hairs sparse, short and dark.

*Palpi:* First segment dark with yellow-brown tomentum and long dark hairs, not in a dense tuft; second segment slightly swollen on basal third, tapering to a point as in fig. 13; dark yellowish brown with short black hairs.

*Antennae* (fig. 12): First segment subtriangular, yellowish in ground colour with yellowish-white tomentum and sparse short black hairs; viewed dorsally it appears to be quite dark yellow-brown; second segment very small, overhung by the much larger 1st segment, similar in colour to first dorsally, but laterally appearing darker, orange-brown with short



Figs. 10–13. *Tabanus nefas* n. sp. Holotype female, frons, antenna and palp.

black hairs; third segment short with distinct dorsal angle, dark brown, slightly sooty with bronze pruinescence. Terminal segments similarly coloured, terminal segment black; these are short and sharply tapered.

*Thorax.* Dark brown, slightly rusty medially. It is distorted and partially collapsed and the faint pattern is not easy to determine. However there is greyish tomentum behind the head and two greyish-white sublateral stripes, broad anteriorly and fading in front of scutellum where they are yellowish. There are also indistinct yellowish-white lateral stripes and yellowish tomentum on side margins. Humeral calli light yellow with grey-white tomentum. Notopleural calli brown with black hairs. Hairs on rest of mesonotum short, sparse, not conspicuous, erect black and recumbent bronze but many of them are broken or rubbed off. Pleura brown with very fine yellowish-grey tomentum, yellowed around margins and between pleurites; hairs short, sparse and dark.

*Legs.* Coxae like pleura, but fore coxae darkened interiorly, with short dark hairs longest and thickest on darker inner surface. Fore femora dark shining red-brown with long, fine, sparse black hairs, only the actual joints are very narrowly paled. Middle legs are missing. Hind femora yellow-brown with shorter black hairs and fine dusting of greyish tomentum. Fore tibiae dark red-brown, dulled by dusting of greyish tomentum, hairs black. Hind tibiae similar but yellower. Fore tarsi dark, sooty-brown. Pulvilli yellow. Hind tarsi missing.

*Wings.* Smoky, veins light yellowish. Angle of  $R_4$  very steep and on one wing there is an incompletely formed appendix. Squamae smoky. Haltere stalk yellow, knob light greyish-brown, yellowed along inner edge.

*Abdomen.* Dark sepia brown, probably blacker in fresh specimen, shining with dusting of grey tomentum on first tergite and laterally on second. There is no pattern but on second tergite on either side of midline is an indistinct semicircle of reddish-yellow colour extending from anterior margin, leaving dark median triangle. Hind margins narrowly pale, on tergites 2 and 3 there is an ill-defined dark area just before hind margins. Hairs short, black many rubbed off. Venter slightly more reddish, with very narrow pale hind margins and black hairs.

*Measurements.* Length with antennae 12,0 mm, wing 10,5 mm.

*Locality.* Chipinda Pools, Lundi River, Rhodesia, March 1963, coll. H. Paterson. Holotype ♀ in Natal Museum.

*Key to species of the pullulus-group in Southern Africa (females)*

- |  |         |                        |
|--|---------|------------------------|
| 1. Abdomen and thorax about the same shade of blackish-grey or blue-grey | ..      | 2                      |
| — Abdomen orange-yellow or yellow-brown basally on first four tergites   |         |                        |
|  |         | <b>copemani</b> Austen |
| 2. Tibiae pale with blackened tips                                       | .. .. . | <b>pullulus</b> Austen |
| — Tibiae uniformly dark  | .. .. . | <b>nefas</b> n. sp.    |

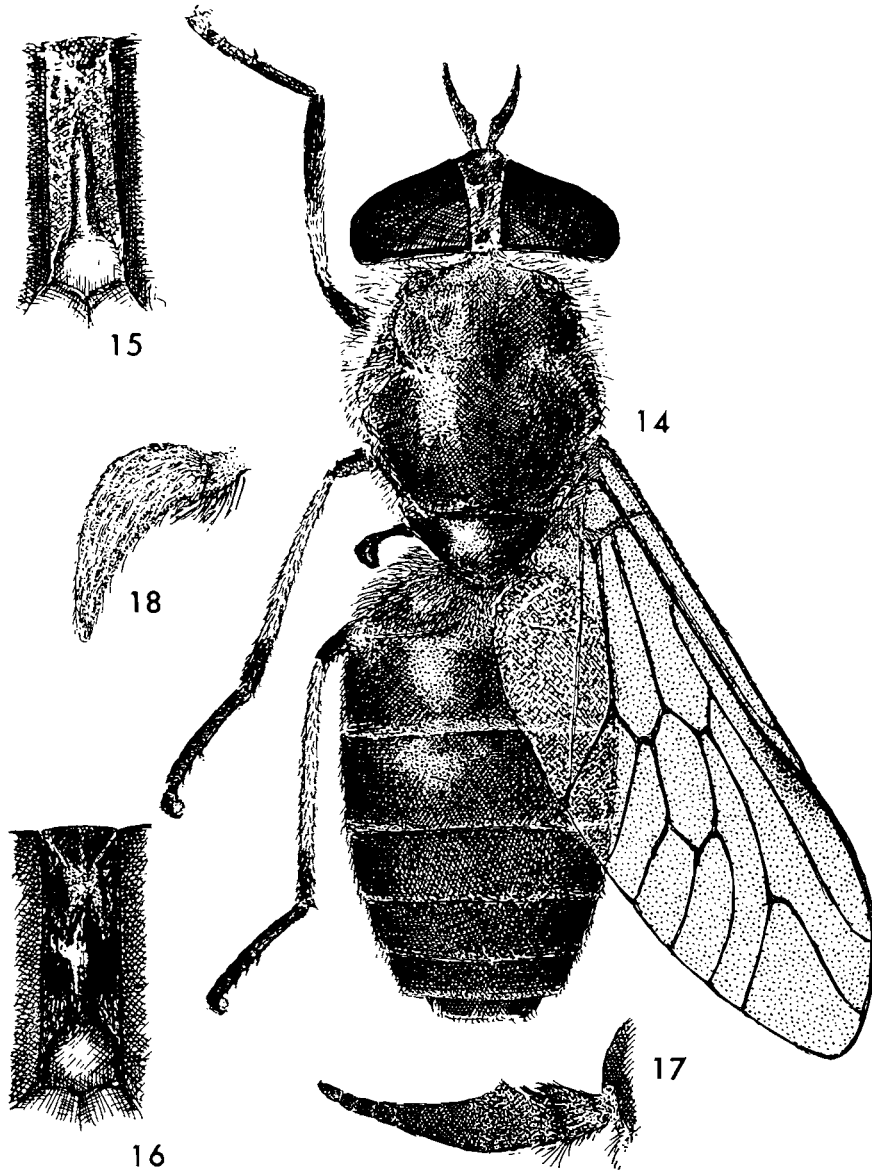
*Diagnosis of species*

Full bibliographic details are given by Oldroyd (1954) for these species.

*Tabanus pullulus* Austen (figs. 14–18)

Medium small, unpatterned, uniformly dark blackish-brown with blue-grey tomentum. Tergites with distinct but narrow pale hind margins. Little thoracic pattern present and that only visible anteriorly in tomentum, not obvious macroscopically. Wings almost hyaline, only faintly greyish. Tibiae pale with darkened tips. Upper callus and vertex dark red-brown or black; lower callus yellow-brown, shining, tomentum thin and silvery-grey, whole appearance of frons dark brown; subcallus red-brown or yellow-brown, prominent, slightly polished. First two antennal segments yellow-brown, third reddish or orange basally becoming dark or blackish apically, terminal segments dark brown or blackish. Palpi purplish-grey or yellow-brown, basally with conspicuously long white hairs, apically with shorter, black hairs.

The mesonotum has very conspicuous coppery hairs; the holotype of *nefas* lacks them but is rubbed so I cannot say for certain that the species can be distinguished by their lack. The character most useful for distinguishing *pullulus* are the strikingly pale tibiae with

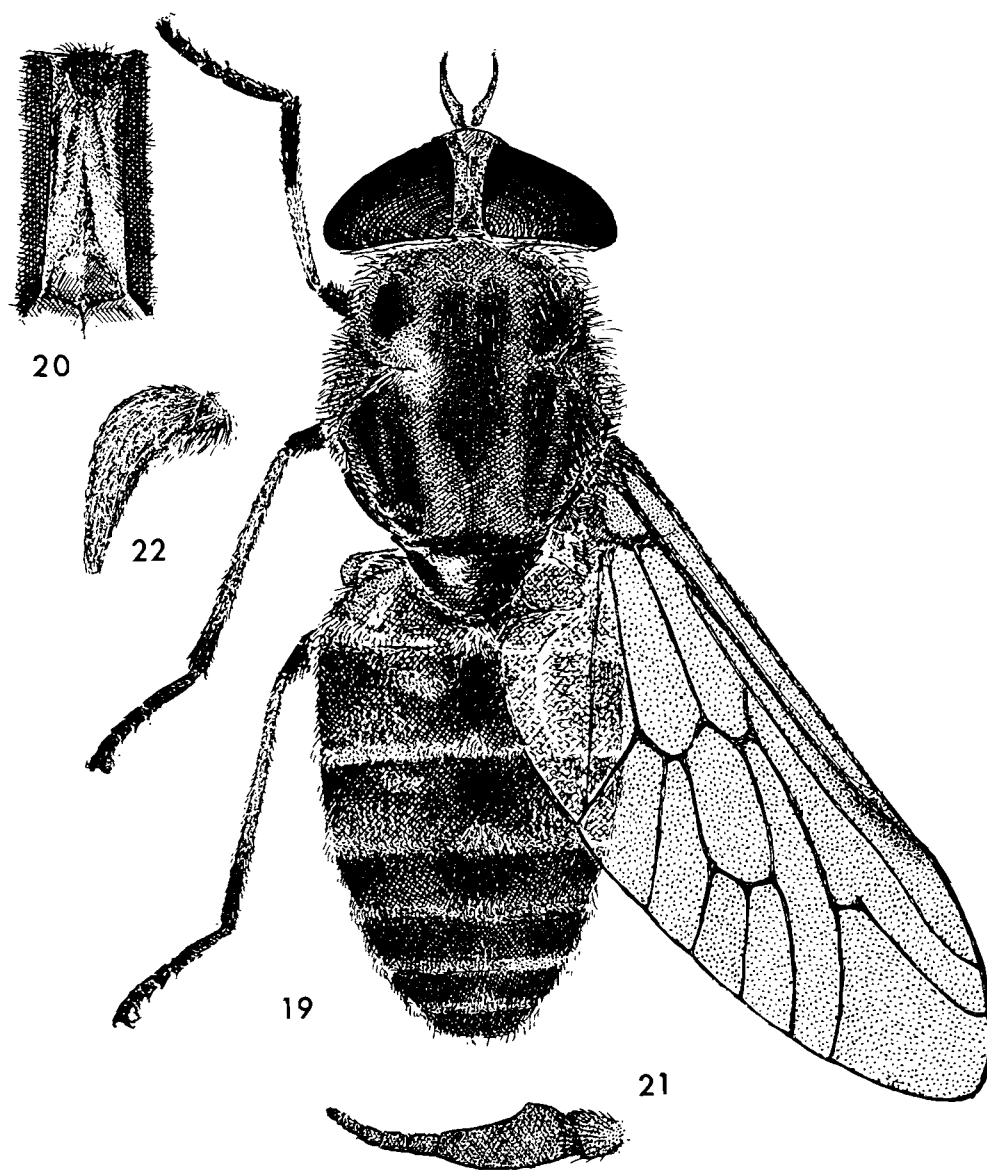


Figs. 14-18. *Tabanus pullulus* Austen. Female, frons of two different specimens, antenna and palp.

darkened tips, and the paler wing. From *copemani* it is easily distinguished by the abdominal colouring as described in the key.

Size: length with antennae 12,5-14,5 mm, wings 9,5-11,5 mm.

Frons index: 2,9-3,1, either parallel-sided or slightly divergent. According to Oldroyd (1954: 205) the frons index in 3,5, but I have not seen a specimen giving this ratio.



Figs. 19-22. *Tabanus copemani* Austen. Female, frons, antenna and palp.

*Tabanus copemani* Austen (figs. 19-22)

Medium-sized, with vague, diffuse pattern or series of ill-defined blotches on anterior tergites and sometimes faint stripes on mesonotum. Thorax black or blackish-brown, patterned in silvery tomentum. Abdomen orange-brown or reddish basally, blackish apically, with dark median marks on pale tergites, and quite wide, parchment-coloured hind margins.

White hairs numerous in small, poorly defined median and lateral triangles which are not backed by tomentum so are lost in rubbed specimens. Wings only faintly greyish. Tibiae whitish with blackened tips. Calli reddish-brown or light yellow-brown. Vertex dark brown, tomentum yellowish-grey or whitish. Subcallus prominent, coloured as calli, shining through very thin tomentum which is easily rubbed. First two antennae segments yellow-brown with short black hairs, third segment bright orange-brown or orange, terminal segments only slightly darkened. Palpi variable in colour, yellowish red-brown, light or dark grey, with white hairs or mixed black and white hairs; shape also a little variable and in some specimens it is plumper than in others.

The abdominal colouring separates this species from the other two species considered here.

Size: length with antennae 12,5–6,5 mm, wings 9,5–12,0 mm.

Frons index: very variable, 2,9–3,5, frons parallel-sided or slightly divergent.

*Tabanus nefas* n. sp. (figs. 10–13)

Medium-sized, unpatterned, uniformly dark, blackish-brown with blue-grey tomentum; faint thoracic pattern visible, certainly more so than in *pullulus* but the thorax of the holotype is damaged and it is not possible to be certain as to the extent of the pattern. Tergites with distinct but narrow pale hind margins. Wings smoky. Tibiae uniformly dark. Calli subshining, pale brownish-yellow, tomentum sparse, reddish above calli, going to grey at darkened vertex. Antennae dark, first two segments dark yellow-brown, third not reddish basally but dark blackish-brown like terminal segments. Palpi dull grey-brown with long, dark hairs on basal segment and short black hairs on second segment which is long, narrow, and only slightly thicker basally. Just behind the head are a few coppery hairs but on the disc of the mesonotum there are none but this may be due to rubbing. Abdomen with numerous black hairs and no coppery ones.

Size: length with antennae 12,0 mm, wing 10,5 mm.

Frons index: 4,1, slightly divergent.

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